# Supplementary material. Parameter Values

Table 1. Parameters Used in the Model of Education Bundle for Patients at Risk of Developing VTE

| **Parameter Description** | **Parameter** | **Source** |
| --- | --- | --- |
| **Population Parameters** |
| Age entering model | 55 | 10 |
| U.S. hospitalized at-risk population | 12,091,153 | 15 |
| Proportion of U.S. hospitalized at-risk population in surgical/trauma group | 61% | 15 |
| Proportion of U.S. hospitalized at-risk population in medical group | 39% | 15 |
| **VTE Transition Probabilities** |
| Probability of VTE predischarge, medical (control) | 0.134% | 1 |
| Probability of VTE predischarge, medical (intervention) | 0.114% | 10, 1 |
| Probability of VTE predischarge, surgical/trauma (control) | 3.439% | 6 |
| Probability of VTE predischarge, surgical/trauma (intervention) | 1.193% | 6 |
| Probability of hospital-related VTE | 0.528% | 1 |
| Probability of recurrence | 2.761% | 27 |
| **Mortality Transition Probabilities** |
| Mortality rate among U.S. hospitalized adults (at risk of VTE) | 1.436% | 28 |
| Mortality rate among adults with VTE (in-hospital) | 5.400% | 29 |
| Probability of mortality in post-VTE state | 0.946% | 3 |
| **PCORI Study Findings** |
| Increase in VTE dose administration as a result of education bundle | 0.632 | 10 |
| Decrease in any missed dose as a result of education bundle | 3.500% | 10 |
| Percentage of at-risk population who miss a dose and receive the intervention | 8.743% | 10 |
| Decrease in VTE event rate  | 0.08% | 10 |
| **Direct Medical Costs** |
| Pharmacologic prophylaxis cost per dose | $44.85 | 30 |
| Hospitalization cost without VTE | $10,198.90 | 17 |
| Hospitalization cost with VTE | $24,458.93 | 17 |
| Post-VTE medical costs | $657.66 | 17 |
| Length of stay for non-VTE hospitalization (days) | 3.05 | 31 |
| Length of stay for VTE hospitalization (days) | 6.48 | 31 |
| Out-of-pocket cost multiplier | 8.58% | 32 |
| Out-of-pocket cost of prophylaxis dose | $3.85 | 32 |
| Out-of-pocket costs of hospitalization without VTE | $875.12 | 32 |
| Out-of-pocket costs as a result of hospital-acquired VTE | $2,098.71 | 32 |
| Out-of-pocket cost post VTE | $56.43 | 32 |
| **Indirect Medical Costs** |
| Travel cost per hospital visit | $3.94 | 23 |
| Number of follow-up visits per VTE event | 2.89 | 16 |
| Total travel cost for follow-up visits  | $11.39 | 23 |
| **Provider Costs** |
| Nurse hourly wage | $37.24 | 21 |
| Nurse hours spent in training | 0.5 | Expert input |
| Number of nurses undergoing training  | 1,000,000 | Expert input |
| Cost of training module | $11.00 | Expert input |
| Nurse training costs (nurse wage × training hours × # of nurses × cost of module) | $204,820,000.00 | Expert input, 21 |
| Paper and printing costs for VTE education bundle (cost per page) | $0.15 | Authors’ assumptions |
| Number of pages to print for VTE education bundle | 2 | 10 |
| Percentage of those receiving intervention who request paper handout | 23% | 10 |
| Total printing cost | $73,141.56 | 10, authors’ assumptions |
| Cost of starting up real-time alert system (per hospital) | $16,944.00 | 19, authors’ assumptions |
| Cost of maintaining real-time alert system (per hospital) | $1,059.00 | 19 |
| Number of hospitals using real-time alert system | 5,235 | 20 |
| **Value of Patient and Caregiver Time** |
| Average hourly wage rate | $35.96 | 21 |
| Average hourly caregiver wage rate | $15.80 | 21 |
| **Productivity Loss** |
| Labor force participation rate among population aged 55 and older | 40.2% | 21 |
| Patient accompaniment rate | 37.6% | 33 |

Note: Dollars are in 2020 values.

PCORI = Patient-Centered Outcomes Research Institute; VTE = venous thromboembolism

# Supplementary material. List of Modeling Assumptions

Table 2

| Assumption | Rationale |
| --- | --- |
| The intervention significantly decreases VTE events at hospital discharge. | Although VTE events decreased in both intervention and control arms in Haut et al. [10]), these decreases were not significant. However, Haut et al. [10] was not powered to find a decline in VTEs. Other research [6] found significant differences in VTE outcomes between patients receiving all doses and missing one dose. To model differences between arms, the study team used the reported differences and explored the uncertainty of this difference in sensitivity and scenario analyses. |
| The intervention effectiveness of decreasing prophylaxis nonadministration and increasing the number of doses of prophylaxis received observed in Haut et al. [10] was assumed to apply to the entire at-risk population receiving the intervention. | All patients who cycle through the intervention are at the same decreased risk of not receiving all prescribed doses, and the percentage who do miss a dose are assumed to have received an additional dose, as observed in Haut et al. [10]. These effectiveness estimates may not extend universally to the entire at-risk population. |
| The additional time nurses spend delivering the intervention is not valued as an additional cost to the intervention. | Providing patient education on the benefits of their treatment is considered a standard responsibility of nurses. |
| The Haut et al. [10] study has a dedicated health educator who delivers the intervention. In a later dissemination study (Owodunni et al., 2020), all floor nurses receive training and deliver the intervention instead of having one dedicated person because most hospitals will not hire a new health educator just to deliver this intervention. It is assumed removing the dedicated health educator does not affect the observed decrease in VTE events used in the model. | The original study had funding for a dedicated health educator. A national implementation is unlikely to replicate that condition, which is why Owodunni et al. (2020) examined the impact of the education bundle in a community hospital, splitting the responsibility among all floor nurses who were required to take a single online educational module. |
| The ratio of type of intervention (i.e., paper handout, one-on-one discussion, or educational video) take-up observed in Haut et al. [10] is assumed to be similar across the country. | The type of intervention requested affects intervention costs (e.g., the cost of printing the paper handouts); it is assumed the results of the study will be generalizable to the rest of the population. The only type of intervention that currently affects provider costs is the paper handout; one-on-one discussion is assumed to be a standard nurse responsibility, and the educational video is available on YouTube. |
| The costs associated with implementing the real-time alert system were based on the authors’ assumptions and the cost of labor.  | Authors assumed that implementing the real-time alert system would take approximately 320 hours of working time at $52.95 per hour (the wage of software developers, quality assurance analysts, and testers) [19]. This resulted in an implementation cost of $16,944. The authors further assumed that the real-time alert system would require 20 hours of maintenance work in each year following the initial implementation. This resulted in an annual maintenance cost of $1,059. These costs were estimated for 5,235 hospitals, an estimate of the total number of hospitals in the United States [20].  |
| Employer and caregiver absenteeism hours assume a 40-hour workweek. | Any patient time lost that amounted to over 40 hours per week was not considered an employee or caregiver absenteeism cost because the standard workweek is 40 hours. |
| Post-VTE mortality assumes 1-year estimates extend beyond 1 year. | For the purposes of this model, the study team used an estimate of mortality at 1 year following VTE and divided it into 3-month intervals. These 3-month mortality probabilities are assumed for the duration of the model cycle. |

VTE = venous thromboembolism